

WHAT IS CLAIMED IS:

5 1. An IV catheter apparatus comprising a tubular catheter
having a proximal end and a distal end, a needle having a needle
shaft and a tip, said needle being received within said tubular
catheter when in a ready position, a catheter hub attached to the
proximal end of said catheter, said catheter hub having a hollow
10 interior and an inner wall, said needle being movable between
said ready position in which said tip is outside of said catheter
hub and a retracted position in which said tip is within the
interior of said catheter hub, a unitary needle guard positioned
in the interior of said catheter hub and including a resilient
15 portion engaged by said needle shaft when said needle is in its
said ready position, a section of said resilient portion of said
needle guard being urged by said needle shaft into contact with
an interior wall of said catheter hub when said needle is in its
said ready position, and an inwardly extending, generally annular
20 protrusion formed on said interior wall of said catheter hub for
engaging a segment of said needle guard for retaining said needle
guard to said catheter hub during the movement of said needle
between its said ready position and its said retracted position,
said needle guard including a distal wall extending from said
25 resilient portion and spaced from said needle tip when said
needle is in its said ready position and movable within the
interior of said catheter hub to a blocking position distal of
said needle tip when said needle is in its said retracted
position in which said needle shaft no longer exerts a force on
30 said resilient portion of said needle guard such that contact
between said section of said needle guard and said catheter hub
is released.

35 2. The IV catheter apparatus of claim 1, in which said
distal wall of said needle guard is contiguous with said

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resilient portion, said distal wall terminating at a curved lip
engaging the underside of said needle shaft when said needle is
5 in its said ready position.

10 3. The IV catheter apparatus of claim 1, in which a slot
is formed in said needle shaft at a location proximal to said
needle tip, said slot being positioned slightly distal of said
contact point of said needle guard proximal arm so that, upon
additional proximal axial movement of said needle, said contact
point on said proximal arm of said needle guard is received in
said needle slot.

15 4. The IV catheter apparatus of claim 1, in which a slot
is formed in said needle shaft at a location proximal to said
needle tip, said slot being positioned slightly distal of said
contact point of said needle guard proximal arm so that, upon
additional proximal axial movement of said needle, said contact
20 point on said proximal arm of said needle guard is received in
said needle slot.

25 5. The IV catheter apparatus of claim 3, further
comprising a needle hub affixed to said proximal end of said
needle and further comprising a tether attached at one end to
said needle hub and at its other end to said needle guard.

30 6. The IV catheter apparatus of claim 4, further
comprising a needle hub affixed to said proximal end of the
needle and further comprising a tether attached at one end to
said needle hub and at its other end to said needle guard.

35 7. The IV catheter apparatus of claim 1, in which a slot
is formed in said needle shaft at a location proximal to said
needle tip, said slot being positioned slightly distal of said

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contact point of said needle guard proximal arm so that, upon additional proximal axial movement of the needle, said contact point on said proximal arm of said needle guard is received in said needle slot.

8. The IV catheter apparatus of claim 7, further comprising a needle hub affixed to said proximal end of the needle and further comprising a tether attached at one end to said needle hub and at its other end to said needle guard.

9. The IV catheter apparatus of claim 8, in which a slot is formed in said needle shaft at a location proximal to the needle tip, said slot being positioned slightly distal of said contact point of said needle guard proximal arm so that, upon additional proximal axial movement of said needle, said contact point on said proximal arm of said needle guard is received in said needle slot.

10. The IV catheter apparatus of claim 9, further comprising a needle hub affixed to said proximal end of the needle and further comprising a tether attached at one end to the needle hub and at its other end to said needle guard.

11. The IV catheter apparatus of claim 6, in which a slot is formed in said needle shaft at a location proximal to said needle tip, said slot being positioned slightly distal of said contact point of said needle guard proximal arm so that, upon additional proximal axial movement of said needle, said contact point on said proximal arm of said needle guard is received in said needle slot.

12. The IV catheter apparatus of claim 1, in which said needle guard further includes an upper end proximal to said

resilient portion and in contact with an opposed interior wall of the catheter hub in said ready position.

5 ~~5~~ 13. The IV catheter apparatus of claim 2, in which said needle guard further includes an upper end proximal to said resilient portion and in contact with an opposed interior wall of the catheter hub when said needle is in its said ready position.

10 14. The IV catheter apparatus of claim 3, in which said needle guard further includes an upper end contiguous with said transverse segment and proximal to said resilient portion and in contact with an opposed interior wall of the catheter hub when said needle is in its said ready position.

15 15. The IV catheter apparatus of claim 2, in which said needle guard further includes an upper end contiguous with said transverse segment and proximal to said resilient portion and in contact with an opposed interior wall of the catheter hub when said needle is in its said ready position.

20 16. The IV catheter apparatus of claim 6, in which said needle guard further includes an upper end contiguous with said transverse segment and proximal to said resilient portion and in contact with an opposed interior wall of the catheter hub when said needle is in its said ready position.

25 17. The IV catheter apparatus of claim 6, in which said needle guard further includes an upper end contiguous with said transverse segment and proximal to said resilient portion and in contact with an opposed interior wall of the catheter hub when said needle is in its said ready position.

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18. The IV catheter apparatus of claim 8, in which said
needle guard further includes an upper end proximal to said
resilient portion and in contact with an opposed interior wall
of the catheter hub when said needle is in its said ready
position.

19. The IV catheter apparatus of claim 11, in which said
needle guard further includes an upper end proximal to said
resilient portion and in contact with an opposed interior wall
of the catheter hub when said needle is in its said ready
position.

20. The IV catheter apparatus of claim 3, in which said
needle guard further includes an upper end proximal to said
resilient portion and in contact with an opposed interior wall
of the catheter hub when said needle is in its said ready
position.

21. The IV catheter apparatus of claim 7, in which said
needle guard further includes an upper end proximal to said
resilient portion and in contact with an opposed interior wall
of the catheter hub when said needle is in its said ready
position.

22. The IV catheter apparatus of claim 1, in which said
needle guard further comprises a proximal arm having a lower
curved segment in contact with an inner wall of said catheter hub
when said needle is in its said ready position.

23. The IV catheter apparatus of claim 22, in which said
proximal arm further includes an upper end in engagement with an
opposed location of said inner wall of said catheter hub distal

to the point of contact with said lower curved segment when said needle is in its said ready position.

5 24. The IV catheter apparatus of claim 23, in which said needle includes a slot formed in its periphery at a location proximal to the needle tip, said needle guard further including a transverse section extending between said proximal arm and said distal wall and including a flexible flap received in said needle slot when said needle guard is in its said blocking position.

10 10 25. The IV catheter apparatus of claim 1, in which said needle guard includes first and second distal walls which overlap one another and form a distal barrier to said needle when said needle guard is in its said blocking position.

11 26. The IV catheter apparatus of claim 25, in which said needle guard further comprises a proximal end wall having an opening for receiving said needle therethrough and first and second arms extending respectively between said proximal end wall and said first and second distal walls.

12 27. The IV catheter apparatus of claim 26, in which each of said arms includes a wide section hingedly secured to said first and second distal walls and a narrow section extending from said wide section to said end wall.

13 28. The IV catheter apparatus of claim 27, in which said needle includes a increased width segment on the needle shaft inward of said needle tip, the width of said increased width segment being greater than that of said opening in said proximal end wall.

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14 29. The IV catheter apparatus of claim 27, in which said
5 needle guard includes a proximal end wall extending from said
resilient portion and including an opening allowing said needle
to pass therethrough, said needle further including an increased
width segment on the needle shaft inward of said needle tip, the
width of said increased width segment being greater than that of
said opening in said proximal end wall.

10 15 30. The IV catheter apparatus of claim 29, in which said
needle guard further comprises a proximal end wall having an
opening for receiving said needle therethrough, said needle
further comprising an increased width segment on the needle shaft
15 inward of said needle tip, the width of said increased width
segment being greater than that of said opening in said proximal
end wall.

20 31. The IV catheter apparatus of claim 15, in which said
needle guard includes a proximal end wall extending from said
resilient portion and including an opening allowing said needle
to pass therethrough, said needle further including an increased
width segment on the needle shaft inward of said needle tip, the
width of said increased width segment being greater than that of
25 said opening in said proximal end wall.

30 8 32. The IV catheter apparatus of claim 23, in which said
needle guard further comprises a proximal end wall having an
opening for receiving said needle therethrough, said needle
further comprising an increased width segment on the needle shaft
inward of said needle tip, the width of said increased width
segment being greater than that of said opening in said proximal
end wall.

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9 33. The IV catheter apparatus of claim 32, in which said
needle includes a circumferential groove forced inwardly of said
tip, said finger being adapted to enter into said groove in the
event an axial force is applied to said needle in the proximal
direction when said needle guard is in its said blocking
position.

116 34. An IV catheter apparatus comprising a tubular catheter
having a proximal end and a distal end, a needle having a needle
shaft and a tip, said needle being received within said tubular
catheter when in a ready position, a catheter hub attached to the
proximal end of said catheter, said catheter hub having a hollow
interior and an inner wall, said needle being movable between
said ready position in which said tip is outside of said catheter
hub and a retracted position in which said tip is within the
interior of said catheter hub, a unitary needle guard positioned
in the interior of said catheter hub and including a resilient
portion engaged by said needle shaft when said needle is in its
said ready position, a section of said resilient portion of said
needle guard being urged by said needle shaft into contact with
an interior wall of said catheter hub when said needle is in its
said ready position, an inwardly extending, generally annular
protrusion formed on said interior wall of said catheter hub for
engaging a segment of said needle guard for retaining said needle
guard to said catheter hub during the movement of said needle
between its said ready position and its said retracted position,
said needle guard including a distal wall extending from said
resilient portion and spaced from said needle tip when said
needle is in its said ready position and movable within the
interior of said catheter hub to a blocking position distal of
said needle tip when said needle is in its said retracted
position in which said needle shaft no longer exerts a force on
said resilient portion of said needle guard such that retaining

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contact between said section of said needle guard and said catheter hub is released.

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35. The IV catheter apparatus of claim 34 in which said distal wall of said needle guard is contiguous with said resilient portion, said resilient portion including a curved lip engaging the underside of said needle shaft when said needle is in its said ready position.

36. The IV catheter apparatus of claim 34, in which said needle guard further includes a transverse arm and a curved upper segment contiguous with said transverse arm and in contact with an opposed interior wall of the catheter hub when said needle is in its said ready position.

37. The IV catheter apparatus of claim 34, in which said needle guard further comprises a proximal wall having a lower curved segment in contact with said interior wall of said catheter hub when said needle is in its said ready position.

38. The IV catheter apparatus of claim 37, in which said proximal wall further includes an upper end in engagement with an opposed location of said interior wall of said catheter hub when said needle guard is in its said ready position.

39. The IV catheter apparatus of claim 34, in which said needle guard includes first and second distal walls which overlap one another and form a distal barrier to said needle when said needle guard is in its said blocking position.

40. The IV catheter apparatus of claim 39, in which each of said distal walls includes a curved lip engaging opposing

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surfaces of said needle shaft when said needle is in its said ready position.

5 ~~23~~ 41. The IV catheter apparatus of claim ~~40~~ ²², in which said first and second distal walls each further include a wide section and a narrow section extending from said wide section toward said proximal end wall.

10 ~~24~~ 42. The IV catheter apparatus of claim ~~39~~ ²⁴, in which said needle guard further comprises a proximal end wall having an opening for receiving said needle therethrough and first and second arms extending respectively between said proximal end wall and said first and second distal walls.

15 ~~25~~ 43. The IV catheter apparatus of claim ~~42~~ ²⁴, in which said needle includes an increased width segment on the needle shaft inward of said needle tip, the width of said increased width segment being greater than that of said opening in said proximal end wall.

20 ~~26~~ 44. The IV catheter apparatus of claim ~~43~~ ²⁵, in which said first and second distal walls each further include a wide section and a narrow section extending from said wide section toward said proximal end wall.

25 ~~27~~ 45. An IV catheter apparatus comprising a tubular catheter having a proximal end and a distal end, a needle having a needle shaft and a tip, said needle being received within said tubular catheter when in a ready position, catheter hub attached to the proximal end of said catheter, said catheter hub having a hollow interior and an inner wall, said needle being movable between said ready position in which said tip is outside of said catheter hub and a retracted position in which said tip is within the

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interior of said catheter hub, and a unitary needle guard substantially positioned in the interior of said catheter hub and including a resilient portion engaged by said needle shaft when said needle is in said ready position, a section of said resilient portion of said needle guard being urged by said needle shaft into retaining contact with an inwardly extending, generally annular protrusion formed upon an interior wall of said catheter hub when said needle is in its said ready position, said needle guard also including a distal wall extending from said resilient portion and spaced from said needle tip when said needle is in its said ready position and movable within the interior of said catheter hub to a blocking position distal of said needle tip when said needle is in its said retracted position in which said needle shaft no longer exerts a force on said resilient portion of said needle guard such that said retaining contact between said section of said needle guard and said catheter hub is released upon the movement of said needle guard to its said blocking position.

28/ 46. The IV catheter apparatus of claim 45, in which said needle guard includes first and second distal walls which overlap one another and form a distal barrier to said needle when said needle guard is in its blocking position.

29/ 47. The IV catheter apparatus of claim 46, in which said first and second distal walls include a wide section and a narrow section extending from said wide section toward said proximal end wall.

20/ 48. The IV catheter apparatus of claim 47, in which said needle guard further comprises a proximal end wall having an opening for receiving said needle therethrough and first and

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second arms extending respectively between said proximal end wall and said first and second distal walls.

5 ³¹49. The IV catheter apparatus of claim ³⁹48, in which said needle includes an increased width segment on the needle shaft inward of said needle tip, the width of said increased width segment being greater than that of said opening in said proximal
10 end wall.

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